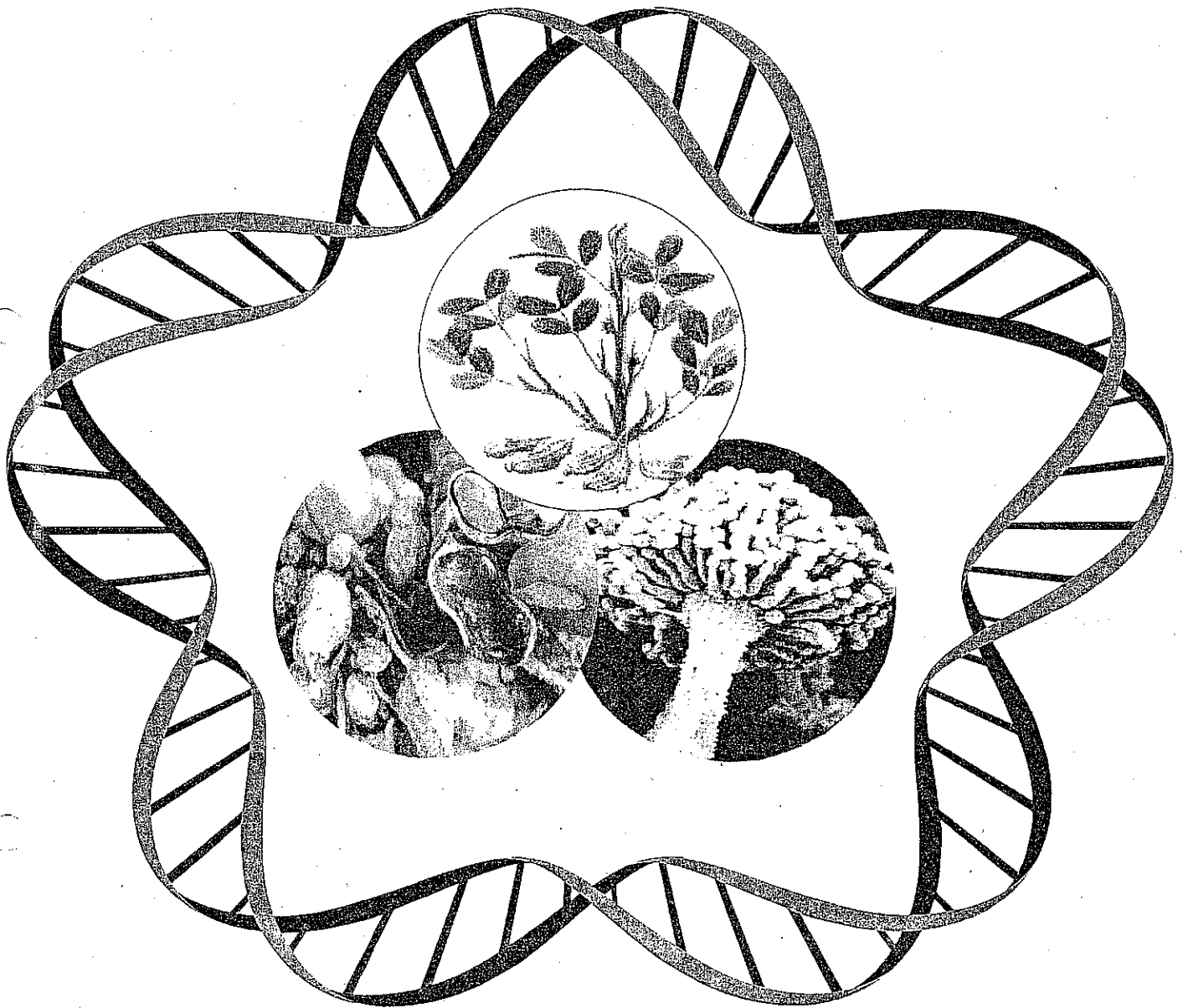


GROUNDNUT AFLATOXIN

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Evaluation of new *Aspergillus flavus* resistant groundnut varieties for agronomic performance in multi-location on-farm trials in Andhra Pradesh, India

F. Waliyar¹, S. N. Nigam¹, P. Q. Craufurd², T. R. Wheeler², S. V. Reddy¹, K. Subramanyam³, T. Yellamanda Reddy³, K. Rama Devi⁴, H. D. Upadhyaya¹ and P. Lava Kumar¹.

¹International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru 502 324, Andhra Pradesh, India; ²The University of Reading, Cutbush Lane, Shinfield, Reading RG2 9AD, UK; ³Agriculture Research Station, ANGRAU, DCMS Buildings, Kamala Nagar, Anantapur, Andhra Pradesh, India; ⁴Society for Transformation, Agriculture and Alternatives in Development (STAAD), Hyderabad, Andhra Pradesh, India

Infection of groundnut seed by *Aspergillus flavus* and *A. parasiticus* is a serious problem that can result in aflatoxin contamination of the produce. These ubiquitous soil-borne saprophytic fungi infect groundnut particularly when end-of-season drought occurs. As aflatoxin contamination is a serious constraint affecting quality and safety of the produce, the major emphasis has been placed on the reduction of aflatoxin contamination through low-cost options feasible for adoption by farmers in developing countries. Cultivation of resistant varieties would be a simple and effective option for farmers, but cultivars with high resistance to aflatoxin contamination and good agronomic characteristics are not available. Using available sources of resistance, 14 new varieties, which have consistently showed <10% seed colonization with *A. flavus* as compared with >50-90% seed colonization in susceptible cultivar TMV-2, were bred at ICRISAT. These varieties are: ICGV 91278, 91279, 91283, 91284, 91315, 91317, 91324, 91328, 91341, 92302, 93305, 93328, 93379 and 94434. These fourteen lines were evaluated for *A. flavus* seed colonization and agronomic performance in farmer participatory, multi-locational on-farm trials in Anantapur and Chittoor districts in Andhra Pradesh, India during 2003-05. All the 14 varieties along with the local variety, TMV-2 were tested in the 9 farmers' fields in 3 villages in each district during the 2003 rainy season following farmers practice. All the test cultivars produced 12-45% higher pod and haulm yields over TMV-2. Aflatoxin contamination ranged between 0-7 $\mu\text{g kg}^{-1}$ in all the test cultivars at all locations compared with 0 to >150 $\mu\text{g kg}^{-1}$ in TMV 2. Based on their performance in 2003 and 2004 seasons, farmers in Chittoor district have selected ICGV 91341, 93305, 94379 and 94434; and farmers in Anantapur ICGV 91278, 91328, 94379 and 94434 for adoption. These varieties have good tolerance to drought, high pod and haulm yield, good fodder quality and good shelling outturn as well as low aflatoxin risk. In 2005 all the selected varieties produced 16-61% higher pod and haulm yield, and 36-73% reduction in aflatoxin contamination over TMV 2 in the two districts. Simultaneously, farmers were trained in post-harvest aflatoxin management methods and utilization of mechanical threshers for rapid harvesting of pods. This study showed that available genetic resistance combined with simple post-harvest management practices is a very effective option for mitigating *A. flavus* and aflatoxin contamination in groundnut. Attempts are being made to upscale these varieties to diverse regions in India.